

is more than $60^{\circ} 45'$ above the horizon the parhelia accompanying the halo of 22° are no longer formed.

In addition to the works previously mentioned valuable articles on halo phenomena will be found in the MONTHLY WEATHER REVIEW for 1897 on pages 294 and 305, and in the volume for 1902, page 317.

METEOROLOGICAL CHARTS OF THE INDIAN OCEAN.

By CHARLES FITZHUGH TALMAN, Section of Ocean Meteorology, U. S. Weather Bureau.

As one result of the recent transfer of the work in ocean meteorology from the Hydrographic Office to the U. S. Weather Bureau, the latter becomes a cooperator in the important studies of the Indian Ocean and adjacent lands, recently undertaken on a large scale by the meteorological service of India. The general plan of this work was outlined by Sir John Eliot, in his notable address before the subsection of Cosmical Physics at the last meeting of the British Association.

The Indian Service published for several years daily synoptic charts of the Indian monsoon area, but the region covered by these charts extended only between 36° north and 12° south latitude. The observations upon which the charts were based were partly made at the shore stations, and partly obtained from meteorological logs of vessels. In view of the vast importance to India of a complete understanding of the conditions which control the monsoon winds and the resultant rainfall, it has been decided to extend the field of observation over the greater part of the Southern Indian Ocean, and also to include broad areas of the surrounding continents and islands.

In order to obtain as many observations as possible from the oceanic areas, and especially from the region of permanent high pressure in the ocean east of Cape Colony, the cooperation of the British, German, and American meteorological services has been requested. These three services are now engaged in securing marine observations from vessels of all nationalities throughout the world. As an indication of the probable number of reports to be furnished by the Weather Bureau, the statement of the Hydrographic Office as to the number of reports of trans-Indian voyages received during the period January 1, 1902, to January 1, 1904, is of interest. The number was 53, and the average time spent within the prescribed area was 51 days, making a total of 2700 observations in 720 days, or approximately four observations a day. To this number, the vessels reporting to the British and German meteorological services, together with those which report direct to the Indian Service, will be added, making up a very respectable total; so that the daily synoptic charts which the Indian Service is to prepare, commencing with January 1, 1905, are likely to present an interesting and valuable picture of the march of weather conditions over this region.

Sir John Eliot says:

It has been found that the abnormal conditions of the past seven years, with their droughts in Australia, Africa, and India, have been associated with abnormal pressure conditions over a very large portion of the earth's surface; and it is hoped that these charts will enable light to be thrown on a number of questions of scientific interest as well as of economic importance.

The new enterprise of the Indian Meteorological Service appears to be an important step in the direction of "world meteorology," with successful long-range forecasting as its ultimate aim.

EARTHQUAKES OF JANUARY AND FEBRUARY, 1905.

By PROF. CHARLES F. MARVIN.

The following notes have reference to two slight earthquakes recorded by the Bosch Omori seismograph at the Weather Bureau in January and February of 1905.

The first, while definitely registered was of short duration and only a few of the characteristic features of such records

were well developed. The second was a much stronger disturbance.

The detailed times of the usual features follow:

Earthquakes of January and February, 1905, seventy-fifth meridian time.

	January 20, 1905, February 14,		
	(p. m.)		(a. m.)
First preliminary tremors began.....	1	6	37
Second preliminary tremors began.....	1	10	58
Principal portion began.....	1	14	38
Principal portion ended.....	1	20	32
End of earthquake.....	1	29	15
Duration of first preliminary tremors.....		4 min.	21 sec.
Duration of second preliminary tremors.....	3 "	40 "	8 "
Duration of principal portion.....	5 "	54 "	4 "
Total duration of earthquake.....	23 "	38 "	1 hr. 5 "
Average period of definite waves, in preliminary portion.....			19.8 sec.
Average period of definite waves in principal portion.....			17.0 "
Period of pendulum.....			28.0 "
Maximum double amplitude of actual displacement of earth at seismograph.....			0.22 mm.
Magnification of record.....			10 times.

The earthquake of February 14 was preceded and followed by very perceptible pulsatory oscillations, by which are meant very slight oscillations that are visible throughout nearly the entire record and which have been noticed to occur from time to time without apparent close connection with other observed phenomena. These oscillations tend to render the determination of the times of beginning and ending of the feebler phases of the earthquake inexact.

DR. J. O. HARRIS.

By WILLIAM G. BURNS, Section Director, U. S. Weather Bureau.

Dr. J. O. Harris, an honored member of the staff of voluntary observers of the Climate and Crop Service of the Illinois Section, died at his home in Ottawa on the morning of January 10, aged 77 years. He was born at Liverpool, Onondaga County, New York, on September 13, 1828. He was a descendant of Revolutionary stock. A graduate in medicine, he entered the Army in 1862 as assistant surgeon of the 53d Illinois infantry. He was public-spirited and identified with every local enterprise. A man of high literary and scientific attainments, as early as 1854 he organized the public library, and his labors in the meteorological field date back to 1853, when he acted as correspondent for the Smithsonian Institution.

Since the organization of the Signal Service in 1870, Doctor Harris has served as voluntary observer, and his labors ceased only with his death.

RECENT PAPERS BEARING ON METEOROLOGY.

Mr. H. H. KIMBALL, Librarian and Climatologist.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a —.

Nature. London. Vol. 71.

Robinson, Edward E. Super-cooled raindrops. P. 295.

— Floods in the United States. P. 308.

MacDowall, Alex. B. The moon and the barometer. P. 320.

Knowledge. London. New Series. Vol. 2.

Clarke, Agnes M. Modern cosmogonies. XII. Our own system.

Pp. 24-26.

— The late Rev. J. M. Bacon. P. 31.

Lockyer, William J. S. Our sun and "weather." Pp. 33-35.

Proceedings of the Royal Society. London. Vol. 74.

Chree, Charles. An analysis of the results from the Falmouth magnetograms on "quiet" days during the twelve years 1891 to 1902. Pp. 323-326.

Journal of Geography. London. Vol. 25.

— A scheme for the comparison of climates. [Review of work of W. F. Tyler.] P. 217.

Science Abstracts. London. Vol. 8.

B[orns], H. Direct and photographic observations of auroras. [Abstract of paper of Sykora.] P. 5.

Ros[enhan], H. Further comparisons of gas thermometers. P. 35.

Starling, S G. Electric conductivity of air and quantity of ozone present. [Abstract of work of V. Conrad and M. Topolansky.] P. 43.

B[orns], H. Diurnal variation of the magnetic elements in Batavia, and sun spots. [Abstract of work of J. Liznar.] P. 54.

Aeronautical Journal. London. Vol. 9.

Baden-Powell, B. The aeronautical competition at the St. Louis exhibition. Pp. 2-4.

Dines, W. H. On kites, kiteflying, and aeroplanes. Pp. 4-7.

Hergesell, M. H. The work of the International Commission for Scientific Aeronautics. Pp. 7-13.

Science. New York. Vol. 21.

Clough, H. W. Synchronous variations in solar and meteorological phenomena. [Abstract of paper of H. W. Clough.] Pp. 174-175.

Fox, Philip. Determination of the solar rotation period from flocculi positions. [Abstract of paper of Philip Fox.] P. 175.

Barus, Carl. Note on the variation of the sizes of nuclei with the intensity of the ionization. Pp. 275-276.

Scientific American. New York. Vol. 92.

— New radium theories. P. 102.

— What we know about sun spots. P. 147.

Scientific American Supplement. New York. Vol. 59.

— On the genesis of radio-activity. P. 24307.

Pernter, J. M. Methods of forecasting the weather. Pp. 24358-24360.

— The molecule, the atom, and the new theory of matter. Pp. 24388-24399.

Journal of Geography. New York. Vol. 4.

Wilcox, Glenn A. A summer shower in Arizona. Pp. 40-41.

Wilcox, Glenn A. An exercise on weather maps. Pp. 41-42.

Popular Science Monthly. New York. Vol. 66.

Campbell, W. W. An address on astrophysics. Pp. 297-318.

School Science and Mathematics. Chicago. Vol. 5.

Abbe, Cleveland. The introduction of meteorology into the courses of instruction in mathematics and physics. Pp. 3-14.

Cox, Henry J. Recent advances in meteorology. Pp. 89-93.

Le Temps qu'il Fait. Mons. 2me année.

— Marconigrams du temps. Pp. 25-27.

V., C. D. L'atmosphère et sa transparence. Pp. 32-36.

Comptes Rendus de l'Académie des Sciences. Paris. Tome 140.

Langevin, P., and Moulin, M. Sur un enregistreur des ions de l'atmosphère. Pp. 305-307.

Hergesell, H. Sur les ascensions de cerfs-volants exécutées sur la Méditerranée et sur l'océan Atlantique à bord du yacht de S. A. S. le Prince de Monaco en 1904. Pp. 331-333.

L'Aérophile. Paris. 13 année.

Blanchet, Georges. Le thermo-ballon de Santos-Dumont. Pp. 20-23.

Journal de Physique. Paris. 4 séries. Tome 4.

Chappuis, P. Détermination de la dilution du mercure. Pp. 12-117.

Archives des Sciences Physiques et Naturelles. Genève. 4 Période. Tome 19.

Elster, J., and Geitel, H. Sur la radioactivité des sédiments des sources thermales. Pp. 5-30.

Rutherford, H. Les problèmes actuels de la radioactivité. Pp. 31-59.

— Observations météorologiques faites aux fortifications de Saint-Maurice pendant les mois de Juin, Juillet, et Août, 1904. Pp. 93-100.

Ciel et Terre. Bruxelles. 25me année.

Ditte, A. Les métaux dans l'atmosphère. Pp. 525-534.

La Nature. Paris. 33me année.

Guillaume, Ch. Ed. Remarquable dépôt de givre. Pp. 98-99.

Jullien, O. Fin de la sécheresse dans la Haute-Savoie. Pp. 102.

Rudeaux, Lucien. Mers de nuages. Pp. 103-105.

Annuaire de la Société Météorologique de France. Paris. 52me année.

Maillon, Edmond. Résumé des observations centralisées par le Service Hydrométrique du Bassin de la Seine pendant l'année 1903. Pp. 249-261.

Teisserenc de Bort, Leon. Sur la quatrième conférence de la Commission Internationale pour l'Aérostation Scientifique à Saint-Petersbourg. Pp. 262-265.

Préaubert, E. Note sur un éclair à propagation lente. P. 270.

Roger, E. Luers crépusculaires et aurorales; cercle de Bishop. Pp. 270-271.

— Résumé des observations météorologique faites en trois stations principales de l'Indo-Chine en 1903. Pp. 271-272.

Annuaire de la Société Météorologique de France. Paris. 53me année.

Moureaux, Th. Résumé de trente années d'observations météorologiques à l'Observatoire du Parc Saint-Maur (1874-1903). III. Pluie. Pp. 9-16.

— Relation entre les marées et les orages. Pp. 24-25.

— Pluie de poussières en 1902. Pp. 25-26.

Das Weltall. Berlin. 5 Jahrgang.

Krebs, Wilhelm. Tornadoes. Pp. 177-180.

Das Wetter. Berlin. 22 Jahrgang.

Sieber, August. Erdbeben und Witterung. Pp. 1-9.

Arendt, Th. Ueber die Gewitterverhältnisse von Berlin und dessen Umgebung. Pp. 9-17.

Assmann, Richard. Das Aeronautische Observatorium bei Berlin im Jahre 1904. Pp. 19-20.

— Wo regnet es am meisten auf der Erde? Pp. 20-21.

Eyre, Stanhope. Das Echo ist nicht alleinige Ursage des langrollenden Donners. Pp. 21-22.

— Lange Reise eines abgerissenen Drachen. P. 23.

Annalen de Physik. Leipzig. 4 folge. Bd. 16.

Brun, Ferdinand. Der Hertsche Gitterversuch im Gebiete der sichtbaren Strahlung. Pp. 1-19.

Annalen der Hydrographie und Maritimen Meteorologie. Berlin. 33 Jahrgang.

Bebber, W. J. van. Bemerkenswerte Stürme. Pp. 49-55.

Möller, Johannes. Beobachtungen von Dämmerungserscheinungen, angestellt auf See. Pp. 55-58.

Petermanns Mitteilungen. Gotha. 50 Band.

Kassner, K. Das regenreichste Gebiet Europas. Pp. 281-285.

Physikalische Zeitschrift. Leipzig. 6 Jahrgang.

Krell, Otto. Ueber Messung von dynamischem und statischem Druck bewegter Luft. P. 61.

Elster, J., and Geitel, H. Weitere Untersuchungen über die Radio-aktivität von Quellsedimenten. P. 67-70.

Mache, H., and Schweidler, E. v. Ueber die spezifische Geschwindigkeit der Ionen in der freien Atmosphäre. P. 71-73.

Schaum, Karl. Ueber die photographische Wirksamkeit des Ozons. Pp. 73-74.

Sitzungberichte der Kaiserlichen Akademie der Wissenschaften. Berlin. LIV. 1904.

Hellman, G. Ueber die relative Regenarmuth der deutschen Flachländern. Pp. 1422-1428.

Zeitschrift für Instrumentkunde. Berlin. 25 Jahrgang.

Rt. Ueber Temperaturmessung. [Abstract of article of M. W. Travers, G. Senter, and A. Jacquierod.] Pp. 19-24.

Beiblätter zu den Annalen der Physik. Leipzig. Band 20.

Lampe, E. Luftwiderstand, Vergleichung der direkten Widerstände verschiedener Gestalten in der Luft. [Abstract of article of Ch. Renard.] P. 2.

Lampe, E. Untersuchungen bezüglich des Luftwiderstandes vermittelst eines neuen, dynamometrische Wage benannten Apparats. P. 2.

Illustrierte Aeronautische Mitteilungen. Strassburg. 9 Jahrgang.

— Die Luftschiffahrt auf der Weltausstellung zu St. Louis 1904. Pp. 1-8.

Bassus, K. v. Ueber die Abbildung von Gewässern in Wolkendecken. Pp. 9-17.

Wiener Luftschiffer Zeitung. Wien. 4 Jahrgang.

Schlein, Anton. Die Wiener November-Hochfahrt. Pp. 2-4.

Schlein, Anton. Internationale Ballonfahrt vom 4 November 1904 (Nachtag.) Pp. 4-6.

— Der Heißluftballon. Pp. 4-6.

— Die Hochfahrten des Wiener Aero-Klub 1901-1904. Pp. 33-34.

— Dines' Drachenversuche. Pp. 36-38.

— Was der Wind kann. Pp. 36-39.

Meteorologische Zeitschrift. Wien. Band 21.

Plehn, —, and Hutter, —. Das Klima von Kamerun. Pp. 537-541.

Hann, J. Klimatabellen für Kamerun. Pp. 541-547.

Hann, J. Einige Ergebnisse der meteorologischen Beobachtungen auf Franz Josephs-Land zwischen 1872 und 1900. Pp. 547-555.

Rosenthal, Elmar. Zur meteorologischen Bedeutung des Vulcanismus. Pp. 555-559.

— A. Gockel über die Abhängigkeit der elektrischen Leistungsfähigkeit der Atmosphäre von den meteorologischen Factoren. Pp. 559-560.

— S. Róna über die heurige Dürre in Ungarn. Pp. 560-564.

Woeikof, A. Bemerkungen über die Temperatur russischer Flüsse und Seen. Pp. 564-565.

Hann, J. Klima von Innichen, Pustertal, Tirol. Pp. 565-568.

— Resultate der meteorologischen Beobachtungen auf dem Ben Nevis in den Jahren 1901 und 1902. Pp. 569-570.

— Die Ben Nevis Observatorien. Pp. 570-571.

— Hepites, St. Klimatabelle für Bukarest. Pp. 571-572.

Hann, J. Hochwasserstände des Nil zwischen 1841 und 1902. Pp. 572-573.

- Mittlerer Regenfall im Bassin des Nil. Pp. 573-574.
 — Resultate der meteorologischen Beobachtungen zu Addis-Abeba in Abessinien. Pp. 574-575.
 — C. Michie Smith über das Klima des Bergobservatoriums Kodai-kánal (2343m) in Südindien. P. 575-576.
H[ann], J[ulius]. Regenmessungen auf Sumatra. P. 576-577.
 — Meteorologische Beobachtungen im Gebiete der Hudsonbai. P. 577.
 — Meteorologische Beobachtungen an der Hudsonbai. P. 577-578.
Bates, D. C. Einige Resultate der meteorologischen Beobachtungen am Observatorium zu Wellington (Neuseeland) 1864-1903. P. 578.
Sapper, Karl. Meteorologische Beobachtungen, angestellt in der Republik Guatemala in den Jahren 1902 und 1903. P. 578-581.
 — Meteorologische Beobachtungen in Paramaribo (Guiana) in den Jahren 1900, 1901, und 1902. P. 581-583.
 — Meteorologische Beobachtungen in Britisch-Aequatorialafrika. P. 583.
Martin, C. Meteorologisches aus Chile. P. 583-584.
Siegel, F. Meteorologische Beobachtungen zu Curityba im Jahre 1903. P. 584.
Hemel en Dampkring. Amsterdam. 2 Jahrgang.
 Nell, A. C. De weervoorschelling met behulp van lokale waarnemingen. P. 131-135.
 N. Chr. A. C. De telegrafische verbinding met Ijsland en de weervoorschellingen. P. 138-140.
Memorie della Società degli Spettroscopisti Italiani. Catania. Vol 33.
Bemporad, A. Tavole ausiliarie per esperienze sull'assorbimento atmosferico. P. 213-225.
Memorias de la Sociedad Científica "Antonio Alzate." Mexico. Tomo 13.
Tenorio, Francisco de P. Ligera critica acerca del abrigo "Pastraná" para termómetros. P. 371-377.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

By Mr. H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Carnegie Institution of Washington. Year book. Nos. 1, 2, 3, 1902, 1903, 1904. v. p. Washington. 1903-1905.

Commission für Oceanographische Forschungen. Achte Reihe. (Aus den Denkschriften der Kais. Akademie der wissenschaften in Wien. Bd. LXXIV.) 323 pp. f°. Wien. 1904.

Egypt. Survey Department, Public Works Ministry. Meteorological report for the year 1902. The Survey Department, Public Works Ministry, Cairo. 204 pp. 12°. Cairo. 1904.

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Finland. Institut Météorologique Central de la Société des Sciences de Finlande. Observations météorologiques publiées par l'Institut Central de la Société des Sciences de Finlande. 1891-1892. vi, (122), 122 pp. f°. Helsingfors. 1904.

France. Association Française pour l'Avancement des Sciences. Compte rendu de la session. Angers. [In two parts.] v. p. 8°. Paris. 1904.

Geographisches Jahrbuch. XXVI. Band, 1903. 496 pp. 8°. Gotha. 1903-1904.

Gorczynski, Ladislas. Etudes sur la marche annuelle de l'insolation. (Extrait du bulletin de l'Academie des Sciences de Cracovie. Classe des sciences mathématique et naturelles. Juillet 1903.) Pp. 466-503. 8°. Cracovie. 1903.

Gorczynski, Ladislas. Sur la diminution de l'intensité du rayonnement solaire en 1902 et 1903. (Comptes rendus de l'Academie des Sciences, Paris. Tome 138, No. 5.) 3 pp.

Great Britain. Meteorological Office. Hourly readings obtained from the self-recording instruments at four observatories under the meteorological council, 1901. Thirty-third year; new series. Volume

II. Published by authority of the Meteorological Council. xii, 197 pp. f°. London. 1904.

Hildebrandsson, H. Hildebrand and Teisserenc de Bort, Léon. Les bases de la météorologie dynamique historique—état de nos connaissances. 7me livraison. Pp. 243-306. 8°. Paris. 1904.

Institut Agricole de Lausanne. Observations météorologiques faites a la Station Météorologique du Champ-de-l'air. Institut Agricole de Lausanne. Année 1903. XVII e année. (16), 43 pp. 4°. Lausanne. 1904.

Leyst, Ernst. Beobachtungen angestellt im Meteorologischen Observatorium der Kaiserl. Universität Moskau im Jahre 1902. Hrsg. von Prof. Dr. Ernst Leyst. 107 pp. 8°. Mockba. 1903.

Leyst, Ernst. Contemporary problems in the study of atmospheric electricity. [Russian text.] 2 pp. 8°. Mockba. 1904.

Leyst, E. Meteorologische Beobachtungen in Moskau im Jahre 1900, 1901, 1902, 1903. v.p. 8°. n.t.p.

Leyst, Ernst. Die Halophänomene in Russland. (Société Impériale des Naturalistes de Moscou.) Pp. 293-428. 8°. Mockba. 1903.

Merecki, Romuald. Klimatologie ziemi Polskich. I. Meokresowa zmienność temperatury powietrza. 112 pp. 4°. Krakow. 1889.

Merecki, Rom. Die Sonnentätigkeit und die unperiodischen Luftdrückänderungen. (Meteorologische Zeitschrift, Wien, Jan., 1904. 17 pp.)

Merecki, R. Wpływ zmiennej działalności słońca na neokresowe ruchy atmosfery ziemskiej. (Odbitka z "Prac matematyczno fizycznych". T. XIV.) 28 pp. Warszawa. 1903.

Observatoire de Zi-Ka-Wei. Calendrier-annuaire pour 1905. 218 pp. 16°. Chang-Hai. 1904.

Paffrath, Josef. Meteorologische Beobachtungen aus dem Rheingebiete von Chur bis zum Bodensee. (XIII Jahresbericht des öffentlichen Privatgymnasiums an der Stella Matutina zu Feldkirch. 1903-1904.) 56 pp. 8°. Feldkirch. 1904.

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Queensland. Water-Supply Department. Map of Queensland showing annual rainfall to end of 1903. Water-Supply Department. 1 sheet. 30 x 22 in.

Rethly, Anton (coll.). Erdbebenbeobachtungen in Königreich Ungarn im Jahre 1903. Zsgst. von Anton Rethly. (Separatabdruck aus: Jahrbücher der k. ung. Reichsanstalt für Meteorologie und Erdmagnetismus. XXXI. Band. Jahrgang 1901. IV. Theil. [Hungarian and German text.] 19 pp. f°. Budapest. 1904.

Richthofen, Ferdinand Frhr. v. (Ed.) Deutsche Südpolar-Expedition auf dem Schiff "Gauss" unter Leitung von Erich von Drygalski. Bericht über die wissenschaftlichen Arbeiten. (Veröffentlichungen des Instituts für Meereskunde geographischen Instituts an der Universität Berlin. Hrsg. von den Direktoren Ferdinand Frhr. v. Richthofen.) Hefte 1, 2, 5. v.p. 8°. Berlin. 1902-1903.

Rotch, A. Lawrence. The first observations with 'ballons-sondes' in America. (Reprinted from Science, N. Y., N. S., Vol. XXI, p. 76-77.)

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Rotch, A. Lawrence. Present problems of meteorology. (Reprinted from Science, N. Y., N. S., Vol. XX, pp. 872-878.)

Rotch, A. Lawrence. A project for the exploration of the atmosphere over the tropical oceans. [Abstract of paper read before VIII International Geographic Congress in 1902.] 1 p. 8°.

Santesson, C. G. and others. Les prix Nobel en 1901. v.p. 8°. Stockholm. 1904.

Saxony. Königlich Sachsisches Meteorologisches Institut. Dekaden-Monatsberichte des Königl. sächsischen Meteorologischen Institutes. 1903. Jahrgang VI. Hrsg. vom Direktor Professor Dr. Paul Schreiber. 100 pp. f°. Chemnitz. 1904.

Saxony. Königlich Sächsischen Meteorologisches Institut. Jahrbuch des Königlich sächsischen meteorologischen Institutes für das Jahr 1900. Jahrgang XVIII. (55), 167 pp. f°. Chemnitz. 1905.

Smithsonian Institution. Report of S. P. Langley, Secretary of the Smithsonian Institution, for the year ending June 30, 1904. 99 pp. 4°. Washington. 1904.

Straits Settlements. Principal Civil Medical Officer. Annual report on meteorological observations in the Straits Settlements for the year 1903, by D. K. McDowell. n.p. f°. Singapore. 1904.

NOTES AND

APPARATUS FOR INSTRUCTION IN PHYSICS AND METEOROLOGY.

The editor has so often been asked what apparatus to buy

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or how best to expend a given amount of money for furnishing a school laboratory, that he would venture a few general remarks on this subject.